

**DISRUPTION & INNOVATION**


## Planning Intentional Small Group and Individual Supports

Okera Hawkins  
4/21/21



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### Meet Okera Hawkins



**Okera Hawkins**

- Mathematics Instructional Coach
- Educational Consultant, Change Agent
- Washington, DC
- Cannot wait for summer!!

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### Before we start

- Use the Q & A feature if you have questions about technology or logistics
- Chat "Everyone" when prompted to respond
- Go to "View Options" to exit full screen to access the links in your web browser
- Recorded session and this PPT deck will be available at ...

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### Access Materials....

Access today's Note Catcher at the following link:

Google Docs






**Copy document**

Would you like to make a copy of *CuP\_Session4\_Materials\_6-12?*

[Make a copy](#)

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### Zoom Norms

-  **Be present:** keep camera on when possible
-  **Audio:** stay on "mute" if you are not speaking
-  **Engage with others:** Zoom Breakout Rooms feature!
-  **Chat:** use the chat feature when prompted
-  **Materials:** Soft copy of the note catcher; links in chat box

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### If math were weather, it would be because...?










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## Plan & Take Action Reflection

### Stop & Jot:

- Since our last session, what have you done to learn more or support teachers/schools with planning for and delivering just in time acceleration supports?
- What did you learn? What might you do the same or differently next time?

*Last time we asked you to:*  
**School-based leaders:** Select one teacher to support in planning "just in time" acceleration supports (small group or whole group) based on their data.  
**District-based leaders:** observe the co-planning session and/or observe the teacher's instruction

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## What are we doing today? Why?



UNDERSTAND.



DIAGNOSE.



PLAN &  
TAKE ACTION.

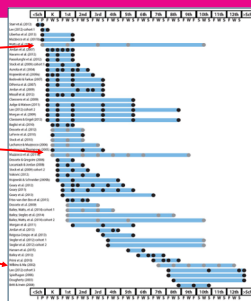
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## Why Intensive Interventions?

Broad math in preK  
predicted grade 10  
broad math

Grade 1 broad math  
predicted broad math at  
grades 3, 5, and 10

Broad math in grade 8  
predicted completion  
of 4-year college  
degree



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## Why Intensive Interventions?



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## Session Agenda

Time	Topic
15 min	Getting Started
45 min	Practice Recommendations for Mathematics Intervention
25 min	Building Fluency
5 min	Reflection & Wrapping Up

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## Today's Learning Targets

- Know research based practices recommendations for small group and individual interventions
- Deepen understanding of instructional practices that do and do not build fluency
- Commit to a bite-sized next step to improve your school's approach to intensive interventions

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## Our Agenda

1. Getting Started
2. Practice Recommendations for Mathematics Intervention
3. Building Fluency
4. Reflection & Wrapping Up

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## Multi-Tiered Systems of Support

**Core Instruction:** On-grade-level, high-quality instruction driven by high-quality curricula in the regular classroom.

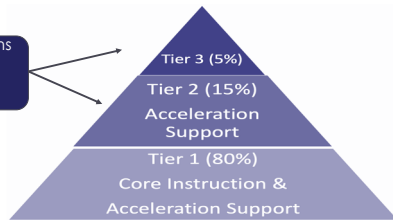
**Acceleration Support:** Timely and targeted support using curriculum-embedded and -aligned materials, mainly in whole group or small group instruction.

**Intensive Intervention:** Small-group or individualized instruction designed to target specific skills using evidence-based, high-quality materials and strategies, including assessments, to monitor student progress.

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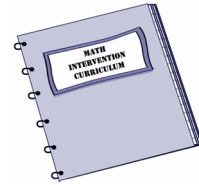
## Intensive Interventions

Intensive Interventions through Small Group or Individual Supports



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## There is no magic bullet



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## Starting Point: Pinpoint student learning needs

In-depth assessment to determine specific areas of need

Universal Screening

Diagnostic Screeners  
Interviews  
Observations

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## Starting Point: Pinpoint the right content

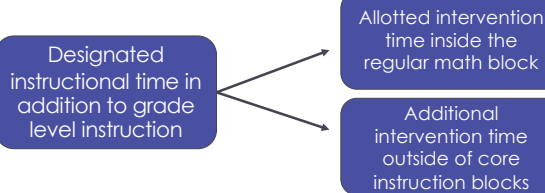
Most important major work

Grades 6-8: Ratios and Proportional Relationships, Expressions and Equations, Arithmetic of Rational Numbers, Linear Algebra and Functions

Grades 9-12: Widely Applicable Prerequisites: Algebra, Functions, Geometry, Number & Quantity, Statistics & Probability

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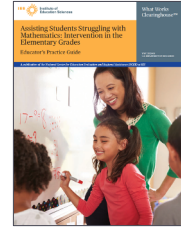
## Starting Point: Pinpoint the instructional time



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## What does the research say?

1. Systematic Instruction
2. Clear and Accurate Language
3. Multiple Representations
4. Use Number Lines
5. Deliberate Instruction of Word Problems
6. Build Fluency through a Strategy-based Approach\*



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## Recommendation

Provide systematic instruction during intervention to develop student understanding of **mathematical ideas**.



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## What is Systematic Instruction?

### Systematic Instruction is....

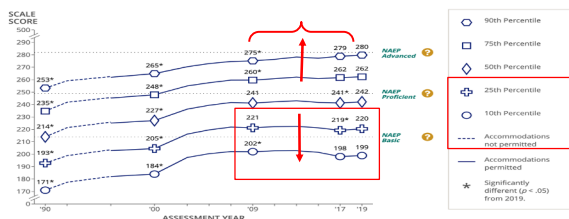
- Curricular materials and instruction designed to develop concepts and skills in an incremental and intentional way
- Connected to learning progressions
- Intentionally building student knowledge over time toward identified learning outcome(s)

### Systematic Instruction is not....

- Direct instruction
- I do, we do, you do
- Telling
- Isolated drill of basic facts
- Teaching skills in isolation from meaningful context

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## Trends in NAEP mathematics scores



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## What's going on here?

- Several studies revealed Tier 2 mathematics instruction middle grade students consisted largely of worksheets.
- Many classrooms and schools use a **one-size-fits-all generic computer** program (a worksheet on a computer).
- Worksheets + computer program ≠ understanding for students who struggle (Foegen & Dougherty, 2010; Swanson, Solis, Ciullo & McKenna, 2012).

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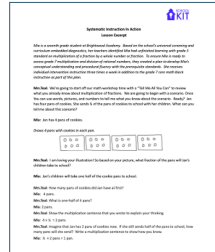
## Systematic Instruction in Action

Read the lesson excerpt vignette.

### Reflect & Discuss:

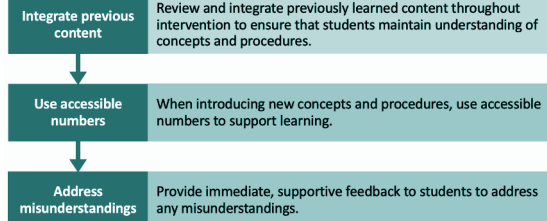
- What do you notice about the questions and tasks in the lesson?
- How does the sequence of the questions and tasks in the lesson support the student with making sense of multiplication of fractions?

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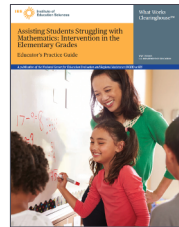
## How to carry out this recommendation...



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## What does the research say?

1. Systematic Instruction
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## Recommendation

Teach clear and concise mathematical language and support students' use of the language to help students effectively communicate their understanding of mathematical concepts



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## Why is this dialogue problematic?

**Teacher:** Ladies and gentlemen, when we multiply binomial by another binomial, where do we start?

**Correct:** We always start by multiplying the first term of the first binomial by the second binomial.

Next I will multiply the second term of the first binomial by the second binomial.

**Teacher:** To solve  $(x - 3)(x + 5)$ , what do we ask first? That's right, we multiply  $x$  by  $(x + 5)$ . After multiplying, who can tell me the product?

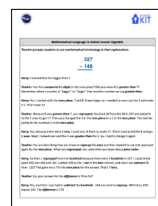
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## Mathematical Language in Action

Read the example lesson vignette.

### Reflect & Discuss:

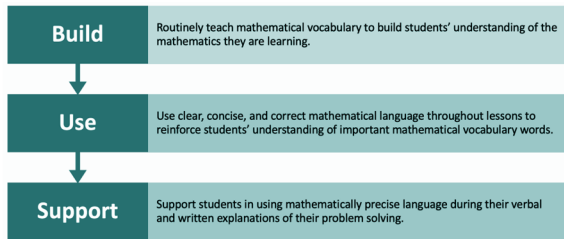
- How does the teacher prompt the student to use mathematical terminology in her explanation?
- How does the terminology support the student with making sense of a standard algorithm?



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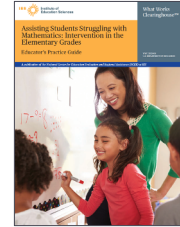
## How to carry out this recommendation...



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## What does the research say?

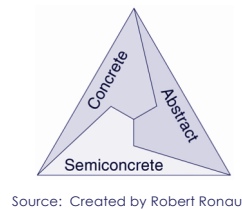
1. Systematic Instruction
2. Clear and Accurate Language
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## Recommendation

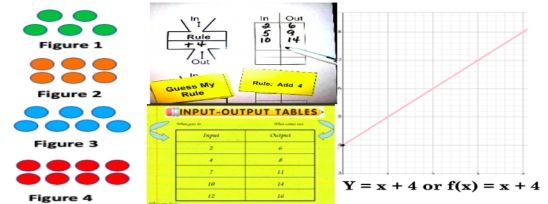
Use a well-chosen set of concrete and semi-concrete representations to support students' learning of mathematical concepts and procedures.



Source: Created by Robert Ronau

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## Concrete → Semi-Concrete → Abstract

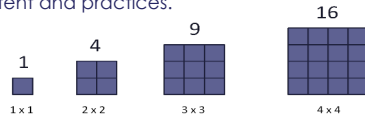


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## Why Representations?

- Representations give students a way to communicate their thinking.
- Representations support deeper understanding of the mathematical content and practices.

**Square Numbers**  
1, 4, 9, 16, 25,...



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## Representations in Action

**Watch** the video.

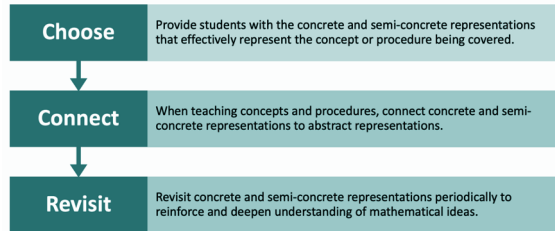
**Reflect & Discuss:**

- How did the representation support the student in making sense of graphs in the coordinate plane?
- What feedback and coaching support might you give this teacher?

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## How to carry out this recommendation...



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## Let's Summarize

Effective small group and individual intervention practices:

- Build mathematical understanding in and across lessons through systematic instruction
- Use clear and concise mathematical language that is consistent with future mathematics learning
- Explicitly connect concepts and procedures through a well-chosen set of concrete, semi-concrete, and abstract representations (as opposed to drilling procedural skills in isolation)

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## Our Agenda

1. Getting Started
2. Practice Recommendations for Mathematics Intervention
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## Unfinished learning can be...

### Conceptual

- Lacking prerequisite knowledge needed to access a grade level lesson or task
- Misconceptions
- Incomplete Understanding

### Procedural

- Understands the mathematics behind the procedure
- Fluency not yet developed

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## Conceptual Unfinished Learning

### Example:

7th grade student needs to understand the concept of a ratio (6.RP.A.1) in order to analyze proportional relationships and use them to solve real-world and mathematical problems (7.RP.A)



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## Procedural Unfinished Learning



### Example:

4th Grade student not yet fluent with basic multiplication facts (3.OA.C.7) may need more support and time to divide multi-digit numbers (4.NBT.B.6).

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## How would you describe fluency?



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## What is fluency?

### Fluency is...

- About understanding
- Attending to efficiency, flexibility, and accuracy
- Mastery of skills and automaticities, but also includes decision-making

### Fluency is not...

- Memorization
- Automaticity with basic facts
- Not having students use their fingers
- The ability to quickly and accurately add, subtract, multiply, and divide with paper and pencil

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## Debunking the Myths

### ~~Myth of One Way:~~

~~Some students are better off knowing just one way.~~

### What the research REALLY tells us:

Each and every student is better off knowing a set of useful strategies and learning when each is useful (and when they are not).

Source: Figuring out Fluency (2021) by J. Bay-Williams & J. SanGiovanni

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## Which is procedural fluency?

### Multiply: 15 ( -19)

#### Student A:

I knew  $15 \times 2$  is 30 so  $15 \times 20$  is 300.  $300 - 15$  is 285. Since one number is negative and the other is positive, final answer is -285.

#### Student B:

$5 \times 9$  is 45.  $9 \times 10$  is 90 add the 4 and you get 135.  $15 \times 10$  is 150 and  $135 + 150$  is 285. The signs are different, so the product is negative.

Equity • Quality • Collaboration • Community

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## Debunking the Myths

### ~~Myth of Concepts First:~~

~~First learn concepts, then learn procedures.~~

### What the research REALLY tells us:

The development of students' conceptual understanding of procedures should proceed and **coincide** with instruction on procedures. Making connections between concepts and procedures is critical. (NCTM, 2014)

Source: Figuring out Fluency (2021) by J. Bay-Williams & J. SanGiovanni

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## What does the research say?

- Strategy groups outperform non strategy groups (Baroody et al. 2016; Brendefur et al., 2015; Locuniak & Jordan, 2008; Purpura et al., 2016).
- Strategy groups retain facts better than non strategy groups (Baroody et al., 2009; Henry & Brown, 2008; Hiebert & Carpenter, 1992; Heibert & Lefevre, 1986; Jordan et al., 2006; Thornton, 1978).
- Strategy use predicts success in math achievement in general (Geary, 2011; Jordan et al. 2007; Jordan et al., 2009; Vasilyeva et al. 2015).

Source: Figuring out Fluency (2021) by J. Bay-Williams & J. SanGiovanni

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## Building Fluency in Action

- Ms. Horstman
- Number Talk: Subtraction
- 8th Grade



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## Lesson Progression

How many ways can we find the difference to this problem below?

$$52 - 16$$



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## Building Fluency in Action

Watch the video.

### Reflect & Discuss:

- How did the practice encourage the use of strategy?
- How does this fluency practice compare to your school's approach to fluency practice?



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## Let's Debrief

- How did the practice encourage the use of strategy?
- How does this fluency practice compare to your school's approach to fluency practice?

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## What is effective fluency practice?

“Instead of helping children develop fluency at computation and become more efficient at problem solving, these policies have produced students that rely more on rote memorization and have increased the level of anxiety in young children by making mathematics a high-risk activity.”  
(Geist 2010, pg. 25-26)

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## Quality Fluency Practice: Recognizing a Pattern

5th GRADE MATHS WORKSHEET COLLECTION

LESSON 28

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5th GRADE MATHS WORKSHEET COLLECTION

Lesson 28

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### Integer Division—Round 1

Write the quotient of the first integer, and write a 0 to the left of the first integer.

Now Stop! Correct.

1. $4 \div 2 = 2$	21. $40 \div 2 = 20$
2. $12 \div 2 = 6$	22. $120 \div 2 = 60$
3. $12 \div 3 = 4$	23. $120 \div 3 = 40$
4. $12 \div 4 = 3$	24. $120 \div 4 = 30$
5. $12 \div 6 = 2$	25. $120 \div 6 = 20$
6. $12 \div 8 = 1.5$	26. $120 \div 8 = 15$
7. $12 \div 10 = 1.2$	27. $120 \div 10 = 12$
8. $12 \div 12 = 1$	28. $120 \div 12 = 10$
9. $12 \div 15 = 0.8$	29. $120 \div 15 = 8$
10. $12 \div 20 = 0.6$	30. $120 \div 20 = 6$
11. $12 \div 25 = 0.48$	31. $120 \div 25 = 4.8$
12. $12 \div 30 = 0.4$	32. $120 \div 30 = 4$
13. $12 \div 40 = 0.3$	33. $120 \div 40 = 3$
14. $12 \div 50 = 0.24$	34. $120 \div 50 = 2.4$
15. $12 \div 60 = 0.2$	35. $120 \div 60 = 2$
16. $12 \div 75 = 0.16$	36. $120 \div 75 = 1.6$
17. $12 \div 100 = 0.12$	37. $120 \div 100 = 1.2$
18. $12 \div 120 = 0.1$	38. $120 \div 120 = 1$
19. $12 \div 150 = 0.08$	39. $120 \div 150 = 0.8$
20. $12 \div 200 = 0.06$	40. $120 \div 200 = 0.6$

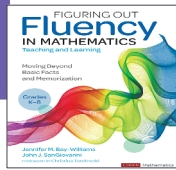
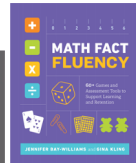
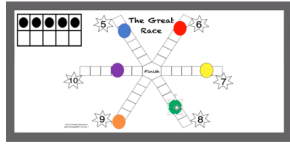
### Integer Division—Round 2

Write the quotient of the first integer, and write a 0 to the left of the first integer.

Now Stop! Correct.

1. $10 \div 2 = 5$	21. $100 \div 2 = 50$
2. $12 \div 2 = 6$	22. $120 \div 2 = 60$
3. $12 \div 3 = 4$	23. $120 \div 3 = 40$
4. $12 \div 4 = 3$	24. $120 \div 4 = 30$
5. $12 \div 6 = 2$	25. $120 \div 6 = 20$
6. $12 \div 8 = 1.5$	26. $120 \div 8 = 15$
7. $12 \div 10 = 1.2$	27. $120 \div 10 = 12$
8. $12 \div 12 = 1$	28. $120 \div 12 = 10$
9. $12 \div 15 = 0.8$	29. $120 \div 15 = 8$
10. $12 \div 20 = 0.6$	30. $120 \div 20 = 6$
11. $12 \div 25 = 0.48$	31. $120 \div 25 = 4.8$
12. $12 \div 30 = 0.4$	32. $120 \div 30 = 4$
13. $12 \div 40 = 0.3$	33. $120 \div 40 = 3$
14. $12 \div 50 = 0.24$	34. $120 \div 50 = 2.4$
15. $12 \div 60 = 0.2$	35. $120 \div 60 = 2$
16. $12 \div 75 = 0.16$	36. $120 \div 75 = 1.6$
17. $12 \div 100 = 0.12$	37. $120 \div 100 = 1.2$
18. $12 \div 120 = 0.1$	38. $120 \div 120 = 1$
19. $12 \div 150 = 0.08$	39. $120 \div 150 = 0.8$
20. $12 \div 200 = 0.06$	40. $120 \div 200 = 0.6$

## Quality Fluency Practice: Games



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## Key Points

- Fluency is more than just basic facts.
- All students need high quality fluency instruction and practice. This is a matter equity.

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## Our Agenda

1. Getting Started
2. Practice Recommendations for Mathematics Intervention
3. Building Fluency
4. Wrapping Up

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## Call to Action

*What is one immediate action you can take?*

- **Review** the Call to Action suggestions.
- **Identify** one Call to Action suggestion you will commit to implementing in the next two weeks, or come up with your own bite-sized Call to Action.

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## Thank You!

Please give us your feedback:

<https://tinyurl.com/CoPMathSession4>

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